REMARKS

Claims 2-9 are pending in the above application. By the above amendment, claim 1 has been cancelled, and claims 3-9 have been added.

The Office Action dated October 30, 2006, has been received and carefully reviewed. In that Office Action, claims 1 and 2 were rejected under 35 U.S.C. 103(a) as being anticipated by Applicant's prior art ("APA") in view of Grosspietsch. By the above amendment, claim 2 has been rewritten in independent form and claim 1 has been cancelled. An antecedent basis issue has also been addressed by changing "ball" to "balls" in claim 2, but this change is not made in response to the rejection under 35 U.S.C. 103(a). New claims 3-9 have been added to further define the present invention. Reconsideration and allowance of claim 2 and examination and allowance of claims 3-9 is respectfully requested in view of the following remarks.

Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over APA in view of Grosspietsch. The Office Action acknowledges that the record does not show the claimed relationship between the curvature radius of the grooves and the diameter of the balls. However, it is stated that selecting the claimed ratio would have been obvious as an "optimization" of ranges in order to "provide better performance and handling." *In re Aller*, 105 U.S.P.Q. 233 (CCPA 1955) is cited to support this rejection.

As provided in MPEP 2144.05(II)(B), "A particular parameter must first be recognized as a result-effective variable, i.e., a variable which achieves a recognized result, before the determination of the optimum or workable ranges of said variable might be characterized as routine experimentation." *In re Antonie*, 195 U.S.P.Q. 6 (CCPA 1977). Thus, minor temperature and/or concentration changes in the *Aller* case were recognized as achieving a certain result. Nothing in the present record, however, suggests that the relationship between groove curvature and ball diameter in a ball/screw assembly is a variable that should be "optimized" to affect "performance and handling." The limitations recited in claim 2 are not present in the art of record, and the record does not show that the claimed relationship is a result effective variable. For these reasons, it is respectfully submitted that claim 2 patentably distinguishes over the art of record and is allowable.

New claim 3 depends from claim 2 and is submitted to be allowable for at least the same

reasons as claim 2. In addition, claim 3 further distinguishes over the art by reciting that the curvature of the bottom of the male thread is not less than the curvature of the balls. The curvature of the bottoms of Grosspietsch's thread grooves are greater than the curvatures of the balls since and the balls do not contact these bottoms. Claim 3 is allowable for this reason as well.

New claim 4 is also submitted to be allowable over the art of record. Claim 4 recites an electric power steering apparatus that includes a cylinder rotatable about a portion of a steering shaft, wherein a portion of a female thread groove on the cylinder and a portion of the male thread groove on the steering shaft that contact the balls are formed in a circular arc shape, and wherein the apex of the circular arc shapes are the bottoms of the thread grooves. Grosspietsch shows balls that contact male and female grooves on the sides of the groove rather than circular arc shapes contacting balls at the bottom of thread grooves as recited in claim 4. Claim 4 is submitted to patentably distinguish over the art of record for at least this reason.

Claims 5 and 6 depend from claim 4 and are submitted to be allowable for at least the same reasons as claim 4.

Claim 7 is also submitted to be allowable over the art of record. Claim 7 recites a power steering apparatus having a steering shaft with a male thread groove surrounded by a cylinder having a female thread groove formed around an inner circumference thereof, wherein the female thread groove has an arc-shaped bottom, having a first curvature, contacting balls and the male thread groove has an arc-shaped bottom, having a second curvature, contacting the balls, where the first curvature is less than the second curvature. The art of record does not show thread grooves having arc shaped bottoms that contact balls as claimed, and claim 7 is submitted to be allowable over the art of record for at least this reason.

Claims 8 and 9 depend from claim 7 and are submitted to be allowable over the art of record for at least the same reasons as claim 7.

CONCLUSION

Each issue raised in the Office Action dated October 30, 2006, has been addressed, and it is believed that claims 2-9 are in condition for allowance. Wherefore, reconsideration and

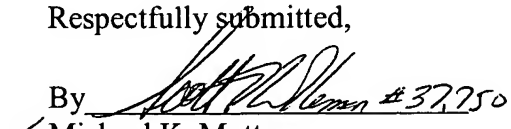
allowance of claim 2 and examination and allowance of claims 3-9 is earnestly solicited.

Should there be any outstanding matters that need to be resolved in the present application, the examiner is respectfully requested to contact Scott Wakeman (Reg. No. 37,750) at the telephone number of the undersigned below, to conduct an interview in an effort to expedite prosecution in connection with the present application.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. §§ 1.16 or 1.14; particularly, extension of time fees.

Dated: January 30, 2007

Respectfully submitted,

By 
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